

1770

S 810/US/Cont

TITLE OF THE INVENTION

**BINDING FOR RETAINING A BOOT ON  
A GLIDING OR ROLLING APPARATUS**

INVENTOR

**Jean-François GONTHIER**

P24979

## **BINDING FOR RETAINING A BOOT ON A GLIDING OR ROLLING APPARATUS**

### **CROSS-REFERENCE TO RELATED APPLICATIONS**

**[0001]** This application is a continuation of U.S. Patent Application No. 09/835,638, filed on April 17, 2001, the disclosure of which is hereby incorporated-by-reference thereto in its entirety and the priority of which is claimed under 35 U.S.C. §120.

**[0002]** This application also claims priority, under 35 U.S.C. §119, of French Patent Application No. 00.05262, filed April 18, 2000, the disclosure of which is hereby incorporated by reference thereto in its entirety.

### **BACKGROUND OF THE INVENTION**

#### **1. Field of the Invention**

**[0003]** The present invention relates to the field of bindings adapted to retain a boot on a gliding or rolling apparatus, such as a ski, a snowboard, a roller skate, or the like.

#### **2. Description of Background and Relevant Information**

**[0004]** Generally speaking, when a user wears flexible boots to operate the apparatus, whether it be a ski, snowboard, or roller skate, e.g., each boot is retained by a binding provided with one or more linkages, such as one or more straps with buckles.

[0005] To be able to put on or remove the boot, i.e., to affix the boot to the binding, or to remove it therefrom, each linkage can be opened or closed. Moreover, the length of the linkage can be adjusted.

[0006] In general, a linkage includes two bands each attached on a respective side of the binding, as well as a device for tightening the linkage. A manual action on a button, buckle, lever or other member of the device enables the linkage to be opened.

[0007] Closing the linkage requires the user to adjust the position of a band with respect to the tightening device, then to introduce the band into the device, and then to reduce the length of the linkage, in particular by means of a lever for driving the band located on the device. To do this, the user generally needs to bend his/her body and lower limbs, and to use both hands.

[0008] Therefore, closing the linkage can be an arduous task and a waste of time for the user.

### SUMMARY OF THE INVENTION

[0009] An object of the present invention in particular is to make it easier and quicker to fit a binding provided with linkages.

[0010] To this end, a binding adapted to retain a boot on a gliding or rolling apparatus, according to the invention, includes a first lateral flange, a second lateral flange, and at least one linkage connecting the first flange to the second flange, the linkage including a first band that extends from one fastening end to one free end, the fastening end being attached to the first flange, the linkage further including a tightening device attached to the second flange, the tightening device making it possible

to adjust the length of the linkage by retaining a portion of the first band in a removable fashion.

**[0011]** An abutment of the binding according to the invention is fixed to the first band toward the free end of the band, so as to be located on the other side of the tightening device with respect to the fastening end of the band, thus preventing a separation of the first band and of the tightening device.

**[0012]** As a result, the user does not have to adjust the position of the band with respect to the tightening device, then to introduce the band into the device. He/She must only adjust the length of the linkage, which can be done with only one hand.

**[0013]** Advantageously, the result is that closing the linkage is easy and quick.

### BRIEF DESCRIPTION OF DRAWINGS

**[0014]** Other characteristics and advantages of the invention will be better understood from the description that follows, with reference to the annexed drawings showing, by way of non-limiting examples, how the invention can be embodied, and in which:

FIG. 1 is a perspective view of a binding, in a case where a boot is retained, according to a first example of embodiment of the invention;

FIG. 2 schematically shows a view of a linkage of the binding, in a case where the length of the linkage is reduced;

FIG. 3 is a cross-section taken along the line III-III of FIG. 2;

FIG. 4 is similar to FIG. 2, in a case where the length of the linkage is substantial;

FIG. 5 is a view similar to FIG. 1, in a case where the boot is not retained;

FIG. 6 is a partial view of the first band of a linkage of the binding, according to a second example of embodiment of the invention; and

FIG. 7 is a partial view of the first band of a linkage of the binding, according to a third example of embodiment of the invention.

### DETAILED DESCRIPTION OF THE INVENTION

[0015] The examples described hereinafter correspond to an application in the field of snowboards.

[0016] According to the first example, as seen in FIG. 1, a binding 1 retains a boot 2 on a board 3.

[0017] In a known manner, the binding 1 includes a base 4 on which a first lateral flange 5 and a second lateral flange 6 are attached, the flanges 5, 6 being transversely spaced apart and connected by an arch 7.

[0018] The base 4 extends, along a longitudinal direction L of the binding 1, between a front end 8 and a rear end 9 of the base.

[0019] Affixing the binding 1 to the board 3 is done by a means shown in the form of a disc 10.

[0020] A rear support element 11, provided to retain the rear of the user's lower leg, is attached on the binding 1, for example, by means of a journal axis 12 on the flanges 5, 6.

**[0021]** The binding 1 also includes a front linkage 13 and a rear linkage 14, each shown in a position for retaining the boot 2 in FIG. 1.

**[0022]** For reasons of convenience and for facilitating an understanding of the invention, only one of the linkages is described hereinafter in more detail.

**[0023]** For example, the front linkage 13 includes in particular a first band 15, a second band 16, and a tightening device 17 making it possible to adjust the length of the linkage.

**[0024]** The first band 15 is attached to the first flange 5, by a means shown in the form of a journal axis 18. By analogy, the second band 16 is attached to the second flange 6, by a means shown in the form of a journal member positioned along axis 19.

**[0025]** The connection of the first band 15 to the second band 16 is done by a tightening device 17 which, to this end, includes in particular a drive lever 20 and a button 21 for releasing the first band 15.

**[0026]** As the tightening device 17 is fixed to the second band 16, by any suitable means, the lever 20 and button 21 make it possible to adjust the length of the linkage 13 by displacing one band with respect to the other.

**[0027]** The structure and functioning of the linkages are explained hereinafter in more detail by means of FIGS. 2-4.

**[0028]** The front linkage 13 is schematically shown in FIG. 2, in a top view, in a case where its length is reduced. This means that the first 15 and second 16 bands are superimposed over a substantial distance.

**[0029]** The first band 15 extends between a fastening end 22 and a free end 23. An opening 24, provided in the fastening end 22, enables the passage of a fastening means or fastener, such as a rivet or other journal connection, to provide the journal member at axis 18.

**[0030]** By analogy, the second band 16 extends between a fastening end 25 and a free end 26. An opening 27, provided in the fastening end 25, enables the passage of a fastening means or fastener, such as a rivet or other journal connection, to provide the journal member at axis 19.

**[0031]** FIG. 3 discloses the internal structure of the linkage 13.

**[0032]** The first band 15 is obtained in the form of a rack, whose teeth 28 and core 29 preferably form a unitary piece.

**[0033]** The tightening device 17 has a passage 30 for guiding the band 15. The passage 30 is formed in particular by two wings 31, 32 connected by a bridge 33. A pawl 34 is journalled between the wings along an axis 35. The pawl 34 has a retaining end 36 provided to oppose a lengthening of the linkage 13, and an end forming the release button 21. The end 36 is constantly biased toward the bridge 33 by an elastic means, not shown, such as a spring.

**[0034]** The drive lever 20 is journalled between the wings 31, 32 along an axis 37. It has at least one tooth 38 for driving the first band 15 in a shortening direction of the linkage 13.

**[0035]** An elastic member or mechanism (not shown for sake of simplicity), such as a spring, constantly biases the lever 20 such that the teeth 38 move away from the bridge 33.

**[0036]** The tightening device 17 is fixed to the second band 16, for example, by means of a rivet having an axis 39.

**[0037]** According to the invention, an abutment 40 is fixed to the first band 15, so as to enable an extension of the linkage to a maximum length, and to prevent a separation of the first band 15 and of the tightening device 17.

**[0038]** Preferably, the abutment 40 is fixed to the free end 23 of the band 15, for example, by a nesting of the band 15 in a cutout 41 of the abutment 40, combined to a retaining element shown in the form of a rivet 42 that extends through the band 15 and the cutout 41.

**[0039]** Complementarily, the abutment 40 is guided along the second band 16, by a guide shown in the form of a screw 43 which extends through a longitudinal slot 44 of the second band 16.

**[0040]** The screw 43 is screwed into the abutment 40. The screw 43 has a head whose diameter is greater than the width of the slot 44.

**[0041]** As a result, the two bands of a same linkage slide parallel to one another when the linkage is extended or shortened.

**[0042]** When the linkage has a maximum length, as is the case in FIG. 4, the abutment 40 is in support on the wings 31, 32, of the tightening device 17.



[0043] Indeed, the abutment 40 cannot pass in the passage 30, because its width is greater than the distance that separates the wings 31, 32. As a result, the bands cannot separate.

[0044] When the user wishes to shorten the linkage, he/she only needs, for example, to act on the drive lever 20.

[0045] This structure of the linkage enables the user to remove the boot, as shown in FIG. 5.

[0046] Each of the linkages 13, 14 is lengthened by a manual action from the user, so as to leave a space between the boot and the linkage. When each space is large enough, the boot can be removed from the binding. Given that the straps of the linkages are journalled on the flanges 5, 6 of the binding 1, it is possible to tilt the linkages 13, 14 toward the front of the binding. In the case of the front linkage 13, the tilting is done rotationally along the axes 18, 19. After tilting, the linkages are positioned to extend substantially along a plane parallel to the base 4.

[0047] Advantageously, the result is that the operations of putting on and removing the boot are made easier, because nothing hinders the movement of the boot into the binding or movement of the boot from the binding. As can be seen in FIG. 5, the two bands 15, 16 of the linkage 13 extend longitudinally along a common plane, the plane intersecting with the fasteners that fasten the linkage to the lateral flanges 5, 6, so that the linkage 13 can assume a flat unrestrained position so that the rider's boot can be readily inserted into, or removed from, the binding.

**[0048]** Preferably, the length of each of the front 13 and rear 14 linkages is such that when it is tilted toward the front of the binding 1, it goes around the front end of the boot 2, if the latter is in position on the base 4 and in contact with the arch 7.

**[0049]** For example, the front linkage 13 can have a maximum length between about 25 centimeters and 50 centimeters, and the rear linkage 14 can have a maximum length between about 45 centimeters and 85 centimeters.

**[0050]** These lengths enable the linkages to go around the boot in the plane of the sole. As a result, the linkages do not create any hindrance when the boot is put on or removed.

**[0051]** The other embodiments of the invention are presented hereinafter.

**[0052]** For reasons of convenience, only the differences with respect to the first example will be shown.

**[0053]** According to the second example, as seen in FIG. 6, an abutment 60 is fixed to the first band 61 of a linkage toward the free end 62 of the band 61. The abutment 60 and the first band 61 are shown in the form of a unitary piece. The binding of the abutment 60 to the band 61 is a broad expression meaning that the abutment and the band are affixed to one another.

**[0054]** The abutment 60 projects with respect to an outer surface 63 of the band, the outer surface 63 facing away from the base of the binding and the boot, whereas the opposite, inner, surface faces toward the boot, i.e., toward the base of the binding. The abutment 60 is shown in the form of a wedge whose surface 64, substantially perpendicular to the surface 63, is turned toward the rack 65 of the band 61 and facing

longitudinally of the band toward the tightening device. The surface 64 takes support on the pawl to avoid an opening of the linkage, because the surface 64 is higher than the teeth of the rack 65.

**[0055]** The band 61 preferably has a longitudinal slot 66.

**[0056]** According to the third example, as seen in FIG. 7, an abutment 70 is fixed to the first band 71 of a linkage toward the free end 72 of the band 71. The abutment 70 and the first band 71 are shown in the form of a unitary piece.

**[0057]** The abutment 70 is shaped like an arrow head, i.e., it has a longitudinally tapered shape, narrowing to the free end of the band 71, the shape including includes two lateral teeth 73, 74 separated at least partially by a slot 75, which is open at the free end of the band.

**[0058]** The teeth 73, 74 prevent an opening of the linkage by taking support on the wings of the tightening device.

**[0059]** The slot 75 enables the teeth 73, 74 to come close together, under the action of an external force, for the mounting or dismounting of the linkage. A hole 76, at the end of the slot 75, prevents the appearance of incipient fractures in the first band 71.

**[0060]** The band 71 preferably has a longitudinal slot 77.

**[0061]** The invention is not limited to the examples described hereinabove, and it includes all of the technical equivalents that fall within the scope of the claims that follow.

**[0062]** In particular, the abutment 40 could be obtained in a different manner. As seen in FIG. 5 in the case of the rear linkage 14, the abutment is obtained in the form of a guide 45 fixed to the free end 46 of a first band 47. The guide is large enough to play its role of an abutment; but at the same time, it enables the guiding of the free end along a second band 48 of the rear linkage 14. In this case, the second band 48 has a continuous width.

**[0063]** The device for tightening the first band could have a different structure. Supplemental layers can be added to the linkage, in particular to ensure functions of protection and ease of use.

**[0064]** Furthermore, a linkage could include only one band and one tightening device. In this case, the tightening device is attached directly to a flange of the binding.

**[0065]** Conversely, a linkage could include more than two bands.

**[0066]** Still, the binding may not include the base, the flanges being in this case directly affixed to the board.

**[0067]** Finally, although the examples have been described for an application in the field of snowboards, the binding according to the invention can be used in other fields such as skis, snowshoes, or the like.